

The Project Framework Matrix

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| Project Number: | Project Title: Isotope Applications to Groundwater Management | Last Update: 26-Sep-00 |
| Project Officer: | Technical Officer : | |
| Main Counterpart: Mr. D.W. Alachee | Organisation: Markos National Geological Survey | |
| Other National Counterparts: Ministry of Water and Natural Resources | | |

| | Project Design Elements | Verifiable Indicators | Means of Verification | Important Assumptions |
|---------------------------------------|---|---|---|---|
| Development/ Overall Objective | Develop clean and reliable groundwater supplies for rural communities and small scale agriculture in a sustainable manner. | <ul style="list-style-type: none"> Increased number of communities using groundwater supplies Quantity and quality of groundwater resources maintained | <ul style="list-style-type: none"> Ministry of Water and Natural Resources reports. National groundwater monitoring program. | <ul style="list-style-type: none"> Pilot-scale results justify nation-wide implementation of water resource initiative. Funding for continued groundwater development available. |
| Specific Objective | Conduct and apply detailed groundwater resource assessments in Tabor and Opechee basins, incorporating isotope hydrology techniques in overall water management planning. | <ul style="list-style-type: none"> Water management plans for both basins completed and applied to water development efforts. Water permits developed on basis of project results. | <ul style="list-style-type: none"> Project reports, development plans, and groundwater production records. Number of permits issued on the basis of technical specifications developed under project. | Water permits issued as planned and permit conditions enforced. |
| Project Outputs | <ul style="list-style-type: none"> Data on aquifer properties, including recharge rates and locations, mixing between aquifers, evaporation rates; Well-head protection zones defined; Procedures for incorporating isotope data in water management planning established. | <ul style="list-style-type: none"> Information compiled and delivered to water development authorities. Technical specifications for groundwater assessments adopted by Ministry of Water and Natural Resources Groundwater Branch. | Project reports, expert missions, Technical Officer missions. | Water resource assessments conducted according to technical specifications. |
| Activities | <ul style="list-style-type: none"> Production wells drilled Water level surveys completed Chemical and isotopic samples collected and analyzed Dug wells surveyed and incorporated in study as | <ul style="list-style-type: none"> Wells in production; Survey and analytical data collected and available; Analytical equipment in operation by local scientists and technicians; | Expert missions, Technical Officer missions. | <ul style="list-style-type: none"> Equipment delivered on time and in good condition; Experts and training delivered as planned; Production wells completed with adequate water supply rates from target aquifers. |

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|---------------------|---|---|---|---|
| IAEA + CP Inputs | <p>appropriate</p> <ul style="list-style-type: none"> • Laboratory facilities upgraded; • Scientists and technicians trained in isotope techniques; • Procedures to apply isotope data to water management planning developed and published. | <ul style="list-style-type: none"> • Procedures documented and available to water sector professionals. | | |
| | <p>IAEA:</p> <ul style="list-style-type: none"> • Analytical services and equipment (liquid scintillation counter, field equipment, GPS); • Expert assistance for planning, data interpretation, and management planning; • Training for project scientists and technicians. <p>CP:</p> <ul style="list-style-type: none"> • Well drilling and surveying; • Laboratory facilities and personnel; • Chemical analyses of water samples | <p>Expert visits completed; equipment purchased, delivered, and installed; training missions completed; activities initiated on schedule.</p> | <p>Procurement records, expert reports, training progress reports</p> | <p>IAEA: Project approved without major modifications</p> |